BSc Mathematics and Economics   UCAS code: GL11
For students entering Part 1 in 2003

Awarding Institution: The University of Reading
Teaching Institution: The University of Reading
Relevant QAA subject benchmarking group(s):   Mathematics, Statistics and
                                               Operational Research, and
                                               Economics.

Faculty of Science   Programme length: 3 years
Date of specification: 18-Mar-05
Programme Director: Dr S. P. Burke
Programme Adviser: Dr S. P. Burke (Economics), Dr J. A. Leach (Mathematics)
Board of Studies: Mathematics and Economics
Accreditation: -

Summary of programme aims
The course aims to impart a broadly based training in both subjects, a good preparation for work in quantitative economics and competence to use mathematical methods to create and study models of economic behaviour. In addition, it aims to provide a range of appropriate subject-specific and transferable skills. (For a full statement of the programme aims and learning outcomes see below.)

Transferable skills
The University's Strategy for Teaching and Learning has identified a number of generic transferable skills which all students are expected to have developed by the end of their degree programme. In following this programme, students will have had the opportunity to enhance their skills relating to career management, communication (both written and oral), information handling, numeracy, problem-solving, team working and use of information technology.

By the end of the programme students are expected to have gained experience and show competence in the following transferable skills: IT (word-processing, using mathematics, econometric and standard software), scientific writing, oral presentation, team-working, problem-solving, use of library resources, time-management, and career management and planning.

Programme content
The profile which follows states which modules must be taken (the compulsory part), together with one or more lists of modules from which the student must make a selection (the "selected" modules). Students must choose such additional modules as they wish, in consultation with their programme adviser, to make 120 credits in each Part.

Part 1 (three terms)		*Credits*	*Level*
Compulsory modules			
EC1F1A	*Introductory Economics I*	20	C
EC1F1B	*Introductory Economics II*	20	C
EC1F5	*Introductory Quantitative Techniques*	20	C
MA11A	*Introduction to Analysis*	20	C

MA11B	*Calculus and Applications*	20	C
MA11C	*Matrices, Vectors & Applications*	20	C

Part 2 (three terms)   Credits   Level
Compulsory modules

EC201A	*Microeconomics I.1*	20	I
EC202A	*Macroeconomics I.1*	20	I
EC203A	*Introductory Econometrics I.1*	20	I
MA24A	*Analysis*	20	I
MA24B	*Differential Equations*	20	I
MA24H	*General Skills and Numerical Analysis*	20	I

Part 3 (three terms)   Credits   Level
Compulsory modules

EC302A	*Macroeconomics II.1*	20	H
MA37A	*Complex Analysis and Calculus of Variations*	20	H

Optional modules:
(i) *20 credits from*:

MA37E	*Numerical Analysis and Dynamical Systems 1*	20	H
MA3B7	*Graph Theory* †	20	H
MA3C7	*Boundary-Value Problems* †	10	H
MA3D8	*Asymptotic Methods* †	10	H
MA3W7	*Control Systems* †	10	H
MA3N7	*Reaction-Diffusion Theory* †	20	M
MA3Y8	*Mathematical Logic* †	20	H

(‡ Given in academic years those starting in an even-numbered year, † given in academic years those starting in an odd-numbered year.)

(ii) *20 additional credits of Level H or M Mathematics in Part 3.*

(iii) *40 additional credits from*

EC301A	*Microeconomics II.1*	20	H
EC301B	*Microeconomics II.2*	10	H
EC302B	*Macroeconomics II.2*	10	H
EC303A	*Applied Econometrics II.1*	20	H
EC303B	*Applied Econometrics II.2*	10	H

(iv) *Alternative options in Economics may be available after discussion with the Programme Director (Dr S. P. Burke)*

Progression requirements
To proceed to Part 2 it is sufficient to obtain an average of at least 40% in the Part 1 Mathematics modules taken together, and in the Part 1 Economics modules taken together, and have no module mark below 30%. Marks of less than 30% in a total of 20 credits, except for MA11A, MA11B, MA11C, EC1F1A, ECF1B, EC1F5, will be condoned provided that the candidate has pursued the course for the module with reasonable diligence and has not been absent from the examination without reasonable cause.

To gain a threshold performance at Part 2 and qualify for the DipHE a student shall normally be required to achieve an overall average of 40% over 120 credits taken in Part 2, and a mark of at least 30% in individual modules amounting to not less than 100 credits. In order to progress from Part 2 to Part 3, a student shall normally be required to achieve a threshold performance at Part 2.

Summary of teaching and assessment

Teaching is organised in modules that typically involve both lectures and problems. The assessment is carried out within the University's degree classification scheme, details of which are in the programme handbooks. The pass mark in each module is 40%. Modules in Part 1 and 2 are assessed by a mixture of coursework and formal examination. There are some modules which are assessed wholly by coursework and others wholly by examination; the details are given in the module descriptions.

Part 2 contributes one third of the final assessment and Part 3 the remaining two thirds.

Admission requirements

Entrants to this programme are normally required to have obtained:
Grade C or better in English in GCSE; and achieved
UCAS Tariff: A Level: 300 points including grade B in A Level Mathematics; or
International Baccalaureat: 30 points including 6 in Higher Mathematics; or
Advanced GNVQ: Merit in one of the following subject areas: Engineering, Information Technology or Science, accompanied by A Level Mathematics Grade B or
Scottish Highers: Grade A in Mathematics and three Bs and a C in two other subjects.
Irish Leaving Certificate: Grade A in Mathematics and three Bs and a C in four other subjects
Two AS grades are accepted in place of one A-Level except in Mathematics.

Admissions Tutor: Dr Graham Williams

Support for students and their learning

University support for students and their learning falls into two categories. Learning support includes IT Services, which has several hundred computers and the University Library, which across its three sites holds over a million volumes, subscribes to around 4,000 current periodicals, has a range of electronic sources of information and houses the Student Access to Independent Learning (S@IL) computer-based teaching and learning facilities. There are language laboratory facilities both for those students studying on a language degree and for those taking modules offered by the Institution-wide Language Programme. Student guidance and welfare support is provided by Personal Tutors, the Careers Advisory Service, the University's Special Needs Advisor, Study Advisors, Hall Wardens and the Students' Union.

Within the Mathematics Department additional support is given though practical classes in Part 1. The development of problem-solving skills is assisted by extensive provision of model solutions to problems. The Department of Economics provides class support for all its modules. These are used to discuss problem sets and other forms of specific work that students complete prior to the meetings. There is a Course Adviser to offer advice on the choice of modules within the programme.

Career prospects
In recent years students who have followed this programme have gone into jobs as actuarial trainee, trainee chartered accountant, teaching, business analyst and postgraduate study.

Opportunities for study abroad or for placements
Although there are no formal arrangements for the Mathematics and Economics programme, informal arrangements may be possible.

Educational aims of the programme
The course aims to impart a broadly based training in both subjects, a good preparation for work in quantitative economics and competence to use mathematical methods to create and study models of economic behaviour. In addition, it aims to provide a range of appropriate subject-specific and transferable skills.

Programme Outcomes
The programme provides opportunities for students to develop and demonstrate knowledge and understanding, skills, qualities and other attributes in the following areas:

Knowledge and Understanding

A. Knowledge and understanding of:	Teaching/learning methods and strategies
1. the fundamental concepts and techniques of calculus, analysis and numerical mathematics 2. the use of the basic techniques of mathematics in applicable areas of mathematics, such as differential equations and numerical analysis 3. the fundamental concepts at the core of economic knowledge comprising microeconomics, macroeconomics and quantitative economics. 4. some central techniques in econometrics comprising model specification, estimation, hypothesis testing and evaluation 5. a selection of more specialist optional topics.	The knowledge required for the basic topics is delineated in formal lectures, practical (including computer) and conventional classes, and supervisions supported by directed and assessed self-study. Feedback and guidance are an important part of the process for all three years of study. In the later parts of the course students are expected to work at additional problems on their own and seek help when required. *Assessment* Most knowledge is tested through a combination of coursework and unseen formal examinations. Dissertations and essays also contribute in other parts of the programme.

Skills and other attributes

B. Intellectual skills – able to:	**Teaching/learning methods and strategies**
1. think logically 2. analyse and solve problems 3. organise tasks into a structured form 4. transfer appropriate knowledge and methods from one topic within the subject to another 5. conduct independent study of a chosen topic and report on the results. 6. comprehend the evolving state of knowledge in the degree subject areas.	Logic is an essential part of the understanding and construction of mathematical proofs and is embedded throughout the programme. The quality of solutions to a problems is substantially determined by the structure of that response; analysis, synthesis, problem solving, integration of theory and application, and knowledge transfer from one topic to another are intrinsic to high-level performance in the programme. On the economics side, substantive problems are illustrated in lectures and smaller groups. Essays, project work and problem sets provide related opportunities for problem solving. Lectures supported by essays and discussions provide the basis of ensuring the growing knowledge base becomes comprehensible. *Assessment* 1- 3 are assessed indirectly in most parts of the programme, while 4 contributes to the more successful work. 5 is assessed in the report produced as part of the module *Macroeconomics II.1*. Assessment in economics is through examination questions, essays, project work and problem sets.

C. Practical skills – able to:	**Teaching/learning methods and strategies**
1. understand and construct mathematical proofs 2. formulate and solve mathematical problems 3. analyse numerical methods and respond to the issues of accuracy and stability 4. research and write a report on a chosen topic. 5. use econometric software to analyse complex practical problems.	Mathematical proof is taught in Part 1 lectures and reinforced in practical classes. Problem solving is introduced in lectures in Part 1 and forms a large part of subsequent Mathematics. Numerical analysis courses introduce and develop the ideas of accuracy and stability, illustrated by practical tasks. *Assessment* 1 and 2 are tested both formatively in coursework and summatively in examinations. 3 is assessed practically through coursework and the principles through formal examination. 4 is assessed through the project dissertation in *Macroeconomics II.1*. 5 is practised via applied econometric exercises.

D. Transferable skills – able to:
1. use IT (word-processing, using standard, data exchange, graphics, econometric and mathematical software)
2. communicate scientific ideas
3. give oral presentations
4. work effectively as part of a team
5. use library resources
6. manage time
7. plan their career.

Teaching/learning methods and strategies
The use of IT is an integral part of the practical side of the economics component and in the package *Mathematica* taught in Part 1 mathematics. It is encouraged through applications requiring economic and econometric analysis. Team work, communication skills and career planning are part of one Part 2 module. Time management is essential for the timely and effective completion of the programme. Library resources are required for the project within economics module contribute to the best performances throughout.

Assessment
1 and 2 are assessed through coursework, and in addition to other aspects 1 is required to adequately complete numerical/statistical exercises in economics.. 3 - 5 contribute assessed coursework towards one Part 2 module, and 2, 3 and 5 also in the project. The other skills are not directly assessed but their effective use will enhance performance in later modules.

Please note: This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably expect to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. More detailed information on the learning outcomes, content and teaching, learning and assessment methods of each module can be found in module and programme handbooks.